

DETAILED ACTION

This Office Action is in response to the communication filed on 1/24/08. Applicant's arguments have been considered, but are not persuasive. Claims 1-4 and 7-10 are pending. A telephone interview was conducted on 5/27/08. An interview summary is attached to the Office Action. This Action is FINAL.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 1-4 are rejected under 35 U.S.C. 103(a) as being unpatentable over Keefer, US 2003/0143448.

Keefer teaches a fuel cell power generation system that includes a fuel cell having an anode inlet and exhaust and a cathode inlet and exhaust. The system also includes a gas separation means operable to recover hydrogen gas from the anode exhaust and to provide at least a portion of such hydrogen gas for recycle to the anode inlet (abstract). The fuel cell has an electrolyte membrane in communication with the anode and cathode channel for facilitating ion transport between the anode and cathode channels (0023). The hydrogen gas separation system includes a compressor and a drive system for the compressor that includes means for recovering energy from the hydrogen gas separation system. The drive system may be a gas turbine coupled to the hydrogen gas separation system (0019). The energy recovery means translates the recovered thermal and pressure energy into a drive force for operating the compressor. At least

one of the fuel enriched gas stream or fuel depleted gas stream may be re-circulated to a gas turbine system coupled to a compressor to capture the recirculation stream's energy (0020). Oxidant is supplied to the cathode channels (0023). Also a cathode having reactant gas flow fields which receive air from a pump is admitted prior art (page 4 of the specification). Fuel cell heat recovery may be performed by a heat engine using anode gases or hydrogen as thermodynamic working fluid. The heat engine powers gas compression required for operation of the hydrogen recycle system to enhance fuel cell performance (0049).

Keefer does not explicitly state the fuel cell power generation system including a gas separation means to recycle hydrogen fuel contains a proton exchange membrane fuel cell.

However, the invention as a whole would have been obvious to one having ordinary skill in the art at the time the invention was made because proton exchange membrane fuel cells use hydrogen fuel as the anode gas reactant. One of skill would have found it obvious to use the hydrogen gas separation means for hydrogen gas recycle of Keefer for a system containing a proton exchange membrane fuel cell in view of the fact that proton exchange membrane fuel cells and solid oxide fuel cells both use hydrogen containing fuels for the anode gas. Furthermore, Keefer at least suggests as much at paragraph [0046], which discloses the cogenerated or stored hydrogen as fuel may be used as fuel for a polymer electrolyte membrane fuel cell (proton exchange membrane).

Allowable Subject Matter

Claims 7-10 are allowed. The prior art does not teach or suggest the impeller of claim 7 comprising a compressor of a turbocompressor, a turbine of which is driven by oxidant reactant gas flowing from said oxidant flow field outlets.

Response to Amendment

Applicant's arguments filed 1/24/08 have been fully considered but they are not persuasive.

Applicant asserts hydrogen-rich fuel gas does not drive any turbine in the Keefer reference, but that the turbine is driven by gas effluent. However, Keefer teaches at least one of the fuel enriched gas stream (anode inlet gas) or fuel depleted gas stream (anode exhaust gas) may drive a gas turbine system coupled to a compressor (0020). Examiner also points out that the "said source" does not drive the turbine, but the actual gas drives the turbine.

Applicant asserts that Examiner stated "The prior art does not teach or suggest the impeller of claim 1 comprising a compressor of a turbocompressor, a turbine of which is driven by the same hydrogen rich gas which is applied the fuel reactant flow fields". Examiner never stated this as reasons for allowance. Applicant stated during the telephone interview of 5/27/08 that the assertion was in error.

Conclusion

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event,

however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Tracy Dove whose telephone number is 571-272-1285. The examiner can normally be reached on Monday-Thursday (9:00-7:30).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Pat Ryan can be reached on 571-272-1292. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Tracy Dove/
Primary Examiner, Art Unit 1795
May 27, 2008